

Appl. No.: 10/615,231
Amendment Dated December 13, 2005
Reply to Office Action of September 13, 2005

Amendments to the Claims:

1. (Currently Amended) A composite support for a semipermeable membrane, said support comprising
a spunbond nonwoven fabric first layer formed of continuous thermoplastic polymer matrix filaments and binder filaments of a lower-melting thermoplastic polymer composition, said spunbond nonwoven fabric first layer defining a first outer surface of the support; and
a wet-laid nonwoven fabric second layer formed of discrete length thermoplastic polymer fibers, including matrix fibers and binder fibers of a lower-melting thermoplastic polymer composition, said wet-laid nonwoven fabric second layer defining a second outer surface of the support.
2. (Currently Amended) The composite support of claim 1, ~~including a~~ wherein said thermoplastic polymer binder filaments and said thermoplastic polymer binder fibers are formed of the same thermoplastic polymer and serve for bonding said first and second layers to one another.
3. (Cancelled)
4. (Currently Amended) The composite support of claim 2, wherein the continuous matrix filaments of said first layer and the discrete length matrix fibers of said second layer are formed of the same thermoplastic polymer, and said thermoplastic polymer binder fibers are is adhered to the matrix filaments of said first layer and to the matrix fibers of said second layer.
5. (Currently Amended) The composite support of claim 1, wherein said continuous thermoplastic polymer matrix filaments are formed from polyester, polyamide or copolymers thereof.
6. (Currently Amended) The composite support of claim 1, wherein said discrete length thermoplastic polymer matrix fibers are formed from polyester or polyamide.

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7. (Currently Amended) The composite support of claim 1, wherein the continuous matrix filaments of said first layer and the discrete length matrix fibers of said second layer are formed from polyester.

8. (Currently Amended) The composite support of claim 7, wherein said thermoplastic polymer binder filaments and binder fibers comprise[[s]] a polyester copolymer having a lower melting temperature than the polyester polymer of said matrix filaments and matrix fibers.

9. (Original) The composite support of claim 1, wherein the fibers of said wet-laid nonwoven fabric have a length of from about 2.5 to 40 mm and are from about 0.2 to 3.0 denier per filament.

10. (Original) The composite support of claim 1, wherein the filaments of said spunbond layer are from about 1 to 10 denier per filament.

11. (Original) The composite support of claim 1, wherein said spunbond nonwoven has a basis weight of about 10 to 35 gsm and said wet-laid nonwoven has a basis weight of about 30 to 70 gsm.

12. (Original) The composite support of claim 1, wherein said composite support has an overall basis weight of up to 80 gsm.

13. (Original) A filtration device comprising a semipermeable membrane or porous polymer layer adhered to said second outer surface the composite support of claim 1.

14. (Original) A filtration device according to claim 13, wherein said semipermeable membrane comprises at least one polymer selected from the group consisting of cellulose

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acetate, cellulose triacetate, cellulose acetate-cellulose triacetate blends, gelatin, polyamine, polyimide, poly(ether imide), aromatic polyamide, polybenzimidazole, polybenzimidazolone, polyacrylonitrile, polyacrylonitrile-poly(vinyl chloride) copolymer, polysulfone, polyethersulfone, poly(dimethylphenylene oxide), poly(vinylidene fluoride), polyelectrolyte complexes, polyolefin, poly(methyl methacrylate) and copolymers thereof.

15. (Original) A filtration device according to claim 13 wherein a porous polymer layer is adhered to said second outer surface, and a semipermeable membrane is adhered to said porous polymer layer.

16. (Original) A filtration device according to claim 13, wherein said porous polymer layer comprises polysulfone.

17. (Currently Amended) A composite support for a semipermeable membrane, said support comprising

a spunbond nonwoven fabric first layer of continuous polyester polymer filaments defining a first outer surface of the support;

a wet-laid nonwoven fabric second layer of discrete length polyester polymer fibers defining a second outer surface of the support; and

polyester polymer binder present in said first and second layers and serving to bond said first and second layers to one another to form a unitary integral composite, said polyester polymer binder comprising a polyester copolymer composition having a lower melting temperature than the polyester polymer of said fibers and filaments.

18. (Currently Amended) The composite support of claim 17, wherein said binder in said first layer comprises binder filaments and said binder in said second layer comprises binder fibers and ~~said polyester polymer binder comprises a polyester composition having a lower melting temperature than the polyester polymer of said fibers and filaments.~~

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19. (Currently Amended) A composite support for a semipermeable membrane, said support comprising

a spunbond nonwoven fabric first layer of continuous polyester polymer filaments defining a first outer surface of the support;

a wet-laid nonwoven fabric second layer of discrete length polyester polymer fibers defining a second outer surface of the support; and

polyester polymer binder present in said first and second layers and serving to bond said first and second layers to one another to form a unitary integral composite ~~The composite support of claim 18~~, wherein said spunbond nonwoven fabric first layer is formed of matrix filaments of a polyester homopolymer and binder filaments of a lower-melting polyester copolymer, and said wet-laid nonwoven fabric second layer is formed of matrix fibers of a polyester homopolymer and binder fibers of a lower-melting polyester copolymer, and wherein the first and second layers are bonded to one another under heat and pressure whereby the binder filaments and binder fibers soften and fuse to adhere the layers together to form a unitary integral composite.

20. (Original) The composite support of claim 17, wherein the second outer surface of the support is a smooth calendered surface.

21. (Currently Amended) Filtration media comprising

(a) a composite support for a semipermeable membrane, said support comprising

(i) a spunbond nonwoven fabric first layer of continuous polyester polymer filaments defining a first outer surface of the support;

(ii) a wet-laid nonwoven fabric second layer of discrete length polyester polymer fibers positioned in opposing face-to-face relation with said first layer and defining a second outer surface of the support; and

(iii) polyester binder bonding said first and second layers to one another to form a unitary integral composite, said polyester binder comprising a polyester copolymer which

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is present at the interface between said first and second layers, and wherein the polyester copolymer binder is also present throughout said spunbond first layer, and

(b) a semipermeable membrane or porous polymer layer adhered to said second outer surface of said composite support.

22. (Cancelled)

23. (Cancelled)

24. (Original) The filtration media of claim 21, wherein said semipermeable membrane comprises at least one polymer selected from the group consisting of cellulose acetate, cellulose triacetate, cellulose acetate-cellulose triacetate blends, gelatin, polyamine, polyimide, poly(ether imide), aromatic polyamide, polybenzimidazole, polybenzimidazolone, polyacrylonitrile, polyacrylonitrile-poly(vinyl chloride) copolymer, polysulfone, polyethersulfone, poly(dimethylphenylene oxide), poly(vinylidene fluoride), polyelectrolyte complexes, polyolefin, poly(methyl methacrylate) and copolymers thereof.

25. (Original) The filtration media of claim 21, wherein a porous polymer layer is adhered to said second outer surface of said composite support and a semipermeable membrane is adhered to said porous polymer layer.

26. (Original) The filtration media of claim 25, wherein said porous polymer layer comprises polysulfone.

27 - 36 (Cancelled)